

LINCOLN NEBRASKA – SPRING 2016 DRAFT MINUTES Version 1.0
Joint Session of Midwest Pooled Fund Study and Task Force 13, April 20, 2016

Joint session was opened by Dr. Ron Faller Director of the MWRSF welcoming Task Force 13 and Midwest Pooled Fund members to our annual meeting.

The planned Wednesday crash test was rained out, but was re-scheduled [and run] to Friday afternoon. Representatives from 13 state transportation agencies were present at the joint session, including: VA, MO, Iowa, SD, KS, OR, NE, CT, WI, WY, IL, MN, PA.

Faller noted the collaboration between the pooled fund groups and Task Force 13 that these joint sessions affords.

The following made presentations of current interest:

John Durkos of RoadSystems, Inc.: Summary of MSKT MASH Sequential Kinking Terminal. Began with a little background on NCHRP Report 350 and the AASHTO MASH requirements. SKT introduced in 1997 and over 200,000 are installed worldwide. Has extruded up to 80 feet of rail. MASH tests 32 and 33 now include a range of angles from 5 to 15 degrees. MASH Implementation Agreement calls for w-beam terminals sunset date of June 30, 2018. Same sequential kinking technology is used in the MSKT. The terminal was tested on the Midwest Guardrail System (MGS) set at 32" for small car, 28" for pickup except LON test was at 30". All seven MASH tests were conducted including:

- Test 3-30 As rail buckled it caused a little damage to the front corner of the car.
- Test 3-32 done at 5 degrees. Veh rode up on debris but remained stable and upright.
- Test 3-33 also at 5 degrees.
- Test 3-35 LON test at 25 degrees is very severe and required improvements to anchor. Anchor now includes a ground strut between posts 1 and 2.
- Also ran 3 Report 350 tests using MSKT impact head on an NCHRP Report 350 installation.

Don Gripne: Determination of LON for MASH terminals. He proposed that all state highway designers use 25 feet as that portion of the Terminal that is relied upon for LON. NJ says each state has to figure this out for themselves. WI says that grading is critical and exact location of the terminal is important. Much discussion ensued of LON point, terminal pay limits, etc., with no resolution. This may be an RDG issue.

Richard Butler Brifen USA: Wire rope fatigue and damage. When should cables be replaced? Enumerated various damages and wear that should warrant replacement including diameter reduction, broken wires, bird-caging, kinking, heat damage, valley breaks,

Jeff Smith Work Area Protection. Summary of SCI crash cushion. His presentation focused on MASH testing of redirective crash cushions. Discussed the crash testing of the first MASH crash cushion. Emphasized need to run all tests per MASH standard. Need to build history of MASH tests. 73% increase in side impact severity. Believes there is no equivalence between 350 and MASH tests. Should be no conflict of interest between test labs and manufacturer. FHWA requirement for financial disclosure has no enforcement. Believes the 1st redirective attenuator approval should be rescinded because all MASH tests were not run.

Dhafer Marzougi and Ron Faller, NCHRP 03-119. Application of MASH Test Criteria.... CCSA of GMU and MWRSF of UNL. Project just started and want feedback. Here is the link to this NCHRP Project: <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3857>

Law Enforcement Perspective

Drew Bolzer, Lancaster County, Nebraska, Accident Reconstructionist. How does hardware perform in the field? Hardware inventory is critical. Cooperation with law enforcement in the reporting of crashes is also vital. How engineers approach law enforcement is important. Police do not know why they are filling out the form, are not familiar with terminology, and are chronically understaffed. Average cop is not concerned about hardware details. Accident report forms do not allow for full and accurate reporting of events. Reports are more geared towards satisfying the insurance companies. Small ROR hits may be reported as “criminal mischief” and never end up as an accident report. Sometimes the only available info is from the Airbag Control Module.

Model Minimum Uniform Crash Criteria (MMUCC) will result in Nebraska accident report form going from 2 pages to 6 pages.

Noteworthy description of some drivers: HUA (head up a##)

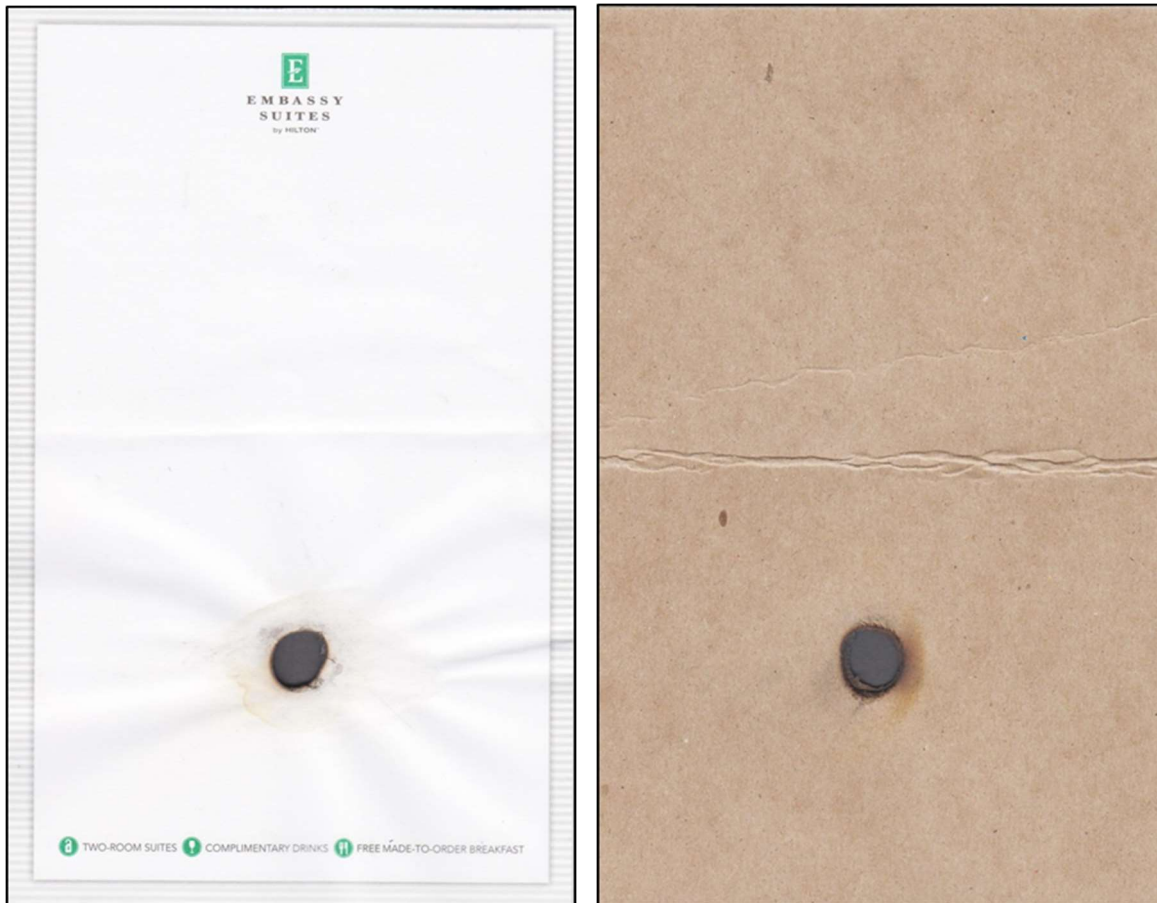
Lance Bullard Texas A&M Transportation Institute: MASH Implementation Coordination Effort thru TTI Pooled Fund Study. Developing a database of devices tested according to MASH and a database of devices that the states want tested to MASH. Chiara Dobrovolny is setting this up. Plan to go live by the AFB20 meetings in Baltimore in June.

Faller noted AFB20 2016 summer meeting in Baltimore, and the 2017 International Conference on Roadside Safety. Look for call for papers which will remain open until the end of June 2016. Available through the AFB20 website: <https://sites.google.com/site/trbcommitteeafb20>

TF13 Meeting begins at 8:00 am on Thursday.

Task Force 13 Spring Meeting - Thursday, April 21, 2016

Task Force Co-Chair John Durkos began the meeting by starting a fire with the data projector. The cardboard used to block the light from the projector began smoking after a few minutes due to the heat from the lamp.



Durkos introduced himself as the industry co-chair and made his semi-annual plea for any state DOT member to volunteer as the state co-chair. Thanked Ron Faller and Valerie Swartz for organizing our spring meeting, as well expressing our appreciation to Larry Bock who has retired from UNL. Thanks also to Nick Artimovich for taking the minutes, plus Karen Boodlal for her coordination efforts and for broadcasting certain sessions. Also thanked co-chairs for their work in subcommittee activity.

We met with the TTI pooled fund group in College Station in the fall of 2015. Changes have been made to the website and Olaf will update us later. Each Tech Rep has been sent a spreadsheet of the drawings and designators along with review status within their category. Each Tech Rep was asked to update the info on their spreadsheets.

Durkos summarized the discussions of the joint session on Wednesday. He also summarized how the TF13 meetings progress and went through the agenda. Artimovich summarized the subcommittee activities as reported from the Fall meeting, and thanked Eric Smith for taking the notes in College Station. The Fall meeting minutes were then approved by the membership.

Durkos emphasized the importance of members reviewing the Task Force 13 drawings, as these are relied upon by AASHTO TCRS as the Roadside Design Guide no longer includes drawings of crashworthy hardware.

Durkos asked if TMAs would be considered as Crash Cushions for the sunset date purpose. Artimovich noted that FHWA has always classified TMAs in the Crash Cushion / Impact Attenuator category. Manufacturers indicated they were shooting for a target date of December 31, 2018.

Subcommittee #1 Olaf Johnson update.

- All FHWA letters now hosted by RoadSafe
- Browse and Search use same categories
- “Obsolete System” has been added to review status, but users cannot see it
- New category of guardrail anchors added.
- BR Hardware and BR Transition guides are now fully cross-referenced.
- Also components are cross referenced on the system sites. (Component pages show which systems they are used in.)
- 260 Hardware systems, 125 Bridge Rail systems, 12 Transitions now listed
- Now need members to update us on their system details.
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Lohrey joined the RoadSafe team to help the programmer as the content expert, as he and Chad Heimbecker did NCHRP Project 20-07/Task 328 to locate and correct info. On line guide requires the FHWA eligibility letter to be included. Links within drawings were removed, logos were added for proprietary drawings, names were revised to make them more descriptive, assigned a Review Status to every drawing (all labeled as “in review” unless they knew that it was reviewed and approved, or has been sent out for voting.)

[FHWA Resource Charts](#) were reviewed and the pertinent information will be added to the appropriate TF-13 guide.

[Transitions guide](#) show the guardrails and bridge rails that they are good for. You can start at transitions, bridge rails, or guard rails to find matching hardware.

All manufacturers should go to [Barrier Hardware Systems](#) and click on the link to your company. Make sure drawings are correct and up to date.

The question was asked if crash cushions and barriers should be set up as separate web sites? Bridge Rails and BR Transitions have been separated from the Barrier Guide. Should CC and End Treatments be separated out, too? Could include additional attributes that do not apply to

longitudinal barriers. Yes, TF would like this done. Keyword search like “bullnose” or “NETC” is on the “to do list.” Contact info should be to an organization, not an individual.

“Not Reviewed” means “No Drawing.” TF asked that this be changed to “No Drawing.” “In Review” means that the drawing has been received but not yet approved.

Rail Heights are now taken directly from the drawings and too precise. Should the heights be grouped?

Durkos noted that logged in members should have access to the old 1995 Barrier guide. Olaf noted that everything appropriate has been uploaded from the 1995 guide. Many components in 1995 guide have obsolete details, but users note that they still reference the older components. For example, a turned-down end that can be used outside of the clear zone should be included, but it has not been crash tested and not posted on-line.

Task Force asks that 1995 PDF be linked as an obsolete system, with appropriate caveats. There was discussion as to whether pre-350 hardware should be shown. It is in the system, but blacked out for users.

Lechtenberg asked how and when will new drawings go on the site? Tech Reps can ask for new drawings to be posted for review.

Subcommittee #2 Barrier Hardware.

Lechtenberg

53 Median barriers are on the website, now need to check to see if they have been reviewed or not, and for any without drawings Karla will request a drawing from the owner. She will ask twice then remove the system from the website. There are also 5 new guardrail systems with 11 components.

Paul Cruse

Crash Cushions. No new drawings since spring of 2015. 6 drawings “In Review”. 21 are marked “Not Reviewed”. Goal is to get cleanup of old drawings before influx of MASH hardware. Please let Paul know if you want to participate in drawing review process. Currently have about 20 reviewers on the list.

Terminals. Derwood Shepherd could not attend this meeting.

Durkos noted there are many drawings that are needed and that need reviews. All TF-13 members should participate in the drawing review process.

Subcommittee # 3 Bridge Railings and Transitions. [Minutes provided by Kurt Brauner]

Roger Bligh welcomed the subcommittee members and gave a brief introduction and overview of the subcommittee, the various working groups, and the online bridge rail guide as well as the transitions guide. Bligh requested that the working group leaders be listed on the website.

Bligh called for volunteers to help review the remaining bridge rail systems in the guide and passed around a sign-up sheet.

Bligh then discussed the review process and displayed the review checklist that is available to assist volunteers.

Next, Bligh discussed proposed changes to the guide which include minor spelling corrections, a designator taxonomy with an example, and the removal of any NCHRP Report 230 systems. He also requested that NCHRP Report 230 be removed as an option in the search criteria.

Lastly, Bligh reiterated his wish for an automated submission process for new bridge rail systems. This process would collect the relevant information, assign a designator, create an entry in the guide, and alert the working group leader that a review was necessary.

Kurt Brauner then gave an update on the Concrete Working Group's status. Currently there are 44 concrete systems in the guide and only 1 has a "Review Complete" status. Brauner presented two systems, SBC 12b and SBC 12d, which have been checked and recommended that their status be changed from "In Review" to "Review Complete". The webmaster for the guide, Olaf Johnson, was in attendance and made these changes during the presentation.

Brauner also presented another pair of systems, SBC 55c and SBC 55d, which have broken links to their respective FHWA eligibility letters. Brauner recommended that the links be fixed and that their status be changed to "Review Complete". Again, Johnson was able to make the changes immediately.

Brauner then discussed how to handle older systems that were "grand-fathered" into the guide and do not have a specific FHWA eligibility letter. Nick Artimovich mentioned FHWA memo B-64 which grants many older systems acceptance / eligibility. In lieu of a specific memo, Brauner recommended that the older systems in the guide link to FHWA Memo B-64.

A question was raised about the need to match the details in the bridge deck when trying to adopt a crash tested / eligible barrier for a project. Artimovich referred the subcommittee to FHWA's website which allows an equivalent section based on an analytical comparison to the crash tested barrier and contains an example developed by Colorado DOT.

Another issue was raised about the need for a disclaimer on each barrier described in the guide to state that:

"The information provided in this guide is for reference only and it is the responsibility of the user/designer to verify that the bridge rail meets current Federal eligibility and safety requirements."

The subcommittee agreed that this was a good idea and should appear in the guide.

Finally, a concern about the browse and search features of the bridge rail guide was brought to the subcommittee's attention. Currently, when browsing rail systems or viewing the results of a search, the summary table does not indicate test level or test specification for which the system is considered eligible. Given that not all test levels between NCHRP Report 350 and MASH are equivalent and the emphasis on MASH implementation moving forward, the subcommittee asked that the summary tables generated by the browse and search features display the test specification and test level.

As time expired, Bligh thanked the committee members for attending and closed the meeting

Subcommittee #5 Sign and Luminaire Supports (Minutes provided by Eric Lohrey)

- Sixteen (16) attendees present.
- The subcommittee still needs a co-chair from a government agency member (FHWA or state DOT). We are asking that candidates expect to attend at least one (1) meeting per year. A state DOT individual has expressed interest, and we are hoping to fill the position by the next meeting.
- Sign Support Guide:
 - Since the last meeting, nine (9) small sign support system drawings were reviewed. Seven (7) are completed and will be labeled "Review Complete" in the online guide. Two (2) drawings need minor revisions and will be accepted after minor revisions are completed.
 - Six (6) sign support systems remain incomplete, and various members have volunteered to contact those manufacturers.
- Luminaire Support Guide: No activity since the last meeting.
- Discussion regarding MASH Implementation for Sign & Luminaire Supports:
 - [NCHRP Project 03-119](#) is just getting underway and will provide evaluations related to MASH performance of common sign & luminaire supports as well as work zone devices. Results of this project are of significant interest to subcommittee members because performance criteria in MASH have changed significantly from NCHRP 350. Pendulum compliance testing is no longer accepted. A complete matrix of full-scale crash tests is now required.
 - Many subcommittee members are not convinced there are problems in the field with current breakaway supports; however there is limited in-service performance evaluation data available at this time.
 - Several manufacturers expressed concerns over their ability to absorb the high cost of full-scale crash testing needed to obtain MASH eligibility.

- Members also discussed a need to conduct research on roof-crush characteristics of MASH vehicles in order to establish maximum structure mass allowed to be used in conjunction with breakaway supports. The current limit of 450kg [992 lbs] for luminaire supports may be outdated for the current vehicle fleet.

Subcommittee #6 Work Zone Hardware (Minutes provided by Tori Brinkley)

Approximately 16 people attended this subcommittee, plus the co-chair/note taker Tori Brinkley, WFLHD-FHWA. (Greg Schertz and Tony Capella were absent.)

- Temporary Concrete Barriers Inspection Guide: Nothing was heard from Priscilla Tobias, Illinois DOT, on the status of support from Illinois in developing a guide. Examples were shown from the Illinois Tollway and Wisconsin DOT on what is in their quality standards for temporary traffic control. Participants said “more teeth” is needed to show and enforce what is not acceptable and needs to be replaced. Items to cover in this guidance would be: Interim connections; where toe of barrier meets the ground or road surface; size and extent of through cracks; and reinforcement exposure. Everyone agreed that pictorial guidance would be best, and we also heard that AHB 55 is working on a guide too that will be discussed at the AFB20 meeting in June 2016.
- Related to concrete barriers was the idea that there should be more standardization of shapes, lengths, connections, rebar, and etc. so that there would be only a (small) handful of temporary barrier designs out there that would need testing to MASH.
- Tony sent an email that said the TMA delineation did not move forward in the NCUTCD, but Neil Boudreau (MA DOT traffic engineer) will bring the subject up again at their next committee meeting.
- It was recommended that TMAs be included in the Work Zone group on the TF13 webpage. The crash-testing of TMAs would fall under the TMA MASH test matrix (Tests 50 through 54).
- Delineators were discussed again in regards to what MASH test criteria they fall under and whether there could be subcategories of devices similar to what was done under NCHRP 350 (where WZTCD had four categories of devices based on weight and/or mass). Permanent and temporary delineators were discussed since there could be overlap of use, though test specifications could be different depending on how the device is used. Having a subcommittee dedicated to delineators (temporary and permanent) could be beneficial to cover test specifications, design, use, and application.
- The discussion then turned to submitting a question to AASHTO in regards to reasonable accommodations for devices under certain mass/weight similar to what was done under NCHRP 350. This could include non-proprietary items that could be built from off-the-shelf items or purchased through a distributor/manufacturer. We weren't aware of the MASH test criteria during the meeting, but it appears that Test 70 for WZTCD is optional for devices weighing less

than 220 pounds, and Tests 71 and 72 can be conducted without instrumentation whenever the test article has a total weight of 220 pounds or less. So for cones and other small or lightweight (<220 lbs) work zone devices, the low speed small vehicle Test 70 is optional, while the TL speed for small (Test 71) and large vehicles (Test 72) can be done without instrumentation as vehicle stability, vehicle intrusion, and windshield damage can be determined visually. So while MASH accounts for smaller, lighter devices, it may help to have an FAQ specifically on work zone devices to clearly see what tests are necessary to be completed, along with whether Tests 71 and 72 are necessary if similar devices have already passed MASH test criteria.

Subcommittee #7 Certification of Test Facilities

Co-chairs: Lechtenberg & Bullard handed out this agenda:

1. Introductions
2. ILCs
 - a. Review 2015 Hood Height ILC – MWRSF
 - b. Discuss 2016 ILC - Determine the start of useable data (t=0) - Caltrans
 - c. Future programmed ILCs
 - i. Accelerometer/A AS mounting concern (standardize mounting?) – TRC
 - ii. Soil - average 10 tests, mean above minimum – KARCO
 - iii. Documentation of ballasting locations and what they weigh – Etech
 - iv. How impact speed is calculated - Turner-Fairbank Highway Res. Center
 - v. Soil gradation - Safe Technologies
 - d. Other ideas discussed at Fall 2015 meeting for ILC's
 - i. Data set
 - ii. Video analysis
 - iii. Report review
3. New Business
 - a. Tested material storage – Lechtenberg
 - b. 2270P Overall Widths - Kruse/Lechtenberg
 - c. Soil Strength Performance Test, App. B MASH - TTI
4. Lab audit experiences - all labs
5. Other business
6. Adjourn

CalTrans will organize the next Inter-Laboratory Comparison (ILC) on Start of Useable Data t=0.

Lechtenberg discussed ILC on Hood Height of the 1100C vehicles. Labs are now measuring to top of radiator support and will report this to Lechtenberg by May 31.

T=0 will be the next ILC. The order of the next ILCs is open to discussion.

Faller believes (i) ARS mounting should focus on 2270P. Is anyone else experiencing floor deformation on Dodge pickups? Caltrans wants to do this as next one, then t=0. Other than swapping first two, go with them as shown.

Recommend adding Truck CG to ILC. Faller suggested sending out a data set and asking the labs to determine how the test meets MASH.

Should test debris remain stored until the FHWA letter is written? MWRSF keeps them until Final Report is written, as some sponsors do not submit for FHWA letter. Private manufacturers are concerned about privacy of their products.

Discussed soil strength issues.

Discussed vehicle damage based on more sophisticated measurement equipment (scanning software). Karco uses FARO arm.

FHWA Update

Artimovich: MASH update. Noted the numerous recent letters posted on the [FHWA Roadway Departure Website](#). He also noted various provisions of the [FHWA/AASHTO Joint MASH Implementation Agreement](#). Numerous research projects have already tested a variety of hardware under MASH criteria including:

Passed MASH testing @ TL-3:

- Modified G4(1S) [marginal pass]
- Midwest Guardrail System
- Free Standing NJ Temporary Barrier
- 32" Permanent NJ shape barrier
- GR to concrete barrier transition
- Weak post box beam
- Weak post w-beam

Failed MASH testing @ TL-3:

- G4(2W) strong wood post w-beam
- G9 thrie beam
- G4(1S) w-beam median barrier

Failed MASH testing @ TL-4:

- 32" Permanent NJ shape barrier
- [36" single slope barrier passed]

Task Force 13 Status:

Durkos: Task Force 13 Affiliation. September 14, 2015, our affiliation with AASHTO / AGC / ARTBA has been sunset. TF-13 wishes to retain a close relationship with AASHTO. AASHTO is committed with a new framework for partnering with Task Force 13.

AASHTO has reached out to us and asked for our services. Durkos notes the strong support by Keith Cota for Task Force 13. Bizuga noted that the Draft AASHTO Committee Reorganization was out for review and included provisions for limited participation by non-members. Executive Board will follow through with AASHTO and recommend a decision to the Task Forces.

Executive Committee. Present were Durkos, Artimovich, Lohrey, Johnson, Lechtenberg, Brauner, Bligh, Patterson, Bullard, Brinkley, Smith.

Gregg Neece of Trinity has volunteered to take on the TF-13 Secretary position upon Artimovich's retirement. Historically, TF-13 Secretary has been with FHWA Office of Safety. Decision will be made soon.

Durkos asked Patterson if Drainage Hardware needs to be resurrected. Survey showed states did not know about the guide, nor has it been used by many states recently when updating standards for LRFD. Patterson will reach out to Nathan Paul.

Dusty Arrington was interested in standardization of delineators. This will be brought up tomorrow.

Email from Mac Ray. Are TF13 presentations up on our website? Johnson will check on server space with respect to crash test videos, etc. Could be saved as PDF and user could go to the source for the video.

Lohrey: test spec option should be changed from MASH to MASH 2009 and MASH 2016? Any cable barriers tested under 2009 should be retested under MASH 2016. Leave website as just "MASH" for now.

Will TF-13 references remain in RDG? Yes, this is likely.

On line guide. We appreciate Johnson's participation as our webmaster. And now he has a better appreciation of how we operate and how drawings are processed through the task force. The drawings that Johnson and Lohrey identified as lacking information do need a lot of work. TF-13 pays about \$6300 quarterly. Lohrey is also providing services under that contract. Johnson was asked to take back the knowledge that TF-13 is pleased with the service and we are willing to increase the funding to move forward faster. Johnson and Lohrey have an idea for improvements. AASHTO state participants in our meeting see the efforts we are making but they are also seeing where we need improvement.

Fall 2016 meeting will be hosted by Derwood Shephard in Florida. Time frame end of October, early November.

What about TF13 secretary? Would AASHTO want someone from FHWA as secretary?

Friday, April 22, 2016

Affiliated committee activities

Nothing from the AASHTO Subcommittee on Bridges and Structures

No one from AASHTO Headquarters. We are anticipating recommended wording from them regarding Task Force 13's potential position in their reorganization.

ATSSA John Durkos showed slides of Ohio's National Work Zone Awareness Week

Ask Don Gripne to report at our next meeting on the NACE meeting in Tacoma, Washington, April 27 and 28, 2016.

Roger Bligh, Chair of AFB20, briefed us on the Committee on Roadside Safety Design. 2016 TRB meeting had 3 subcommittee meetings, 3 paper sessions. There was also the Roadside Safety Data Group Discussion as well as a Simulation forum.

AFB20 Mid-year meeting will be in Baltimore, MD June 20-23.

2017 International Roadside Safety Conference will be held June 12-15 in San Francisco. Call for Abstracts closes June 30, 2016.

Artimovich showed the draft TCRS agenda for Baltimore.

Durkos asked if anyone else is in the process of MASH testing. Nobody spoke up.

Special Subcommittee on Marketing: Nothing to Report (Neither Mauer nor Clark are in attendance) ATSSA Signal included a nice item on Task Force 13.

New Standardization Areas:

Have had limited success with RXR hardware.

Considered these in the past: Barrier mounted supports (Oregon DOT has been using chevrons on corners, many of these are placed on median barriers, should it be breakaway or not? Durkos asked Scott Jullo to put together a presentation on barrier mounted supports if he can attend the next meeting as a Technical Presentation.) We have also discussed V2V and V2I hardware as potential roadside safety issues.

Have recent support on delineators (Dusty Arrington gave a presentation in College Station at the last meeting.) Bligh noted that we should be able to make progress on delineators. Gripne noted that he saw an extruder terminal that had pushed a butterfly delineator and its bolt a foot and a half through the w-beam. Gripne agreed a new subcommittee in this area would be a good idea. A new subcommittee was voted positive. Dusty Arrington, TTI, will be a co-chair and will look for another co-chair before next meeting. The first Delineator Subcommittee meeting will be held in Fall 2016. Should we sunset Drainage and RXR? TF13 is looking into the Drainage Subcommittee to see if it should be resurrected. Divyang asked if Delineators can be part of SubComm#5 on breakaway supports? While delineators do fit in Breakaway, they also fit in WZ, but let's break them out to start. Durkos noted that the topic may draw a lot of ATSSA members...

Alberson noted new project on Pedestrian Bollards (email him for more info.) The Delineator / Delineation subcommittee could start out by considering these devices as well.

Update of Ongoing Research

NCHRP Durkos provided a short presentation due to the absence of Mark Bush. This is what Mark provided:

All of the new problem statements (below) of TF13's interest are slated for fy17 funding:

- 1) Development of methods to evaluate side impacts with roadside safety features.
- 2) Development of a collaborative approach for multi-state in-service evaluations of roadside safety hardware.
- 3) A practical approach to fixed objects within the clear zone (remember all the work and suggestions Mark provided over the course of multi years - we got this one slated for fy17 funds now too. TCRS is happy too!).
- 4) Develop comprehensive objective criteria to reduce serious and fatal lane departure crashes and prepare a major update to the Roadside Design Guide.
- 5) Incorporating road safety planning in the Highway Safety Manual.

Mark is the slated SPO over these in addition to other additional new safety projects in his portfolio.

The NCHRP program is strong and all the active projects are progressing well.

The solicitation for panel member nominations has gone out to all the AASHTO committees also in order to get the new cycle started.

TF13 should be all very pleased as all their interested and priority problem statements were successfully selected for funding this year.

Mark asked to please send his regards to all the TF13 membership.

Mark lobbied hard regarding all the 'safety' problem statements during the AASHTO SCOR annual meeting, and in the end SCOR selected all... so more work for Mark. Mark said he may be his own worst enemy. 😊

Roger Bligh of TTI:

Two projects completed since College Station in October.

Stacked W-beam transition for 31-inch guardrail. Such a design had passed NCHRP Report 350 at 27" rail height with W-beam and W-beam rubrail. The pickup truck had a 50 degree roll angle in that test. When tested under MASH criteria with a 31-inch rail height, the impact performance was unacceptable due to rollover of the pickup truck. The Roadside Safety Pooled Fund group will have to if they want to redesign and retest the system.

High Mounting Height Temporary Single Sign Support with Rigid Sign Substrate. TXDOT was the sponsor. 1 ¾", 12 ga perforated square steel tube (PSST) with H-footprint base supported a 3 ft x 3 ft aluminum sign panel at a mounting height of 7 feet. As a temporary, work zone sign

support system, it was tested at both zero and 90 degrees. A slipjoint comprised of 1 ½" PSST was incorporated to enhance separation of the sign from the support for the 90-degree impact. However, the 90-degree impact still resulted in a cut in roof of the pickup truck that resulted in failure of MASH criteria due to occupant compartment penetration. The system was redesigned with a higher slip joint, but the 90-degree impact still caused a cut in the roof. A third concept that added fuse plates behind the sign panel in combination with the raised slip joint (at 66 inches) resulted in only minor roof deformation and successfully met all MASH criteria. Finally, adding a second slip connection just below the sign panel without the fuse plates was also successful.

MWRSF

Bielenberg: PCB Length of Need / minimum system Minimum system length turned out to be 9 segments at 12.5 feet. Excessive roll angle of 82 degrees in the end-of-LON impact of an 8-segment barrier was failure

NJ PCB Performance under MASH TL-3.

Rosenbaugh: TL-5 Concrete barrier for Manitoba. Design issue is the expansion / contraction joint. Barrier is about 49" tall.

2016 Pooled Fund projects:

- MGS with curbs and omitted posts
- Thrie Beam Bullnose 3 of 10 tests
- MASH TL-4 bridge rail (head ejection)
- Standardized AGT buttress (continued)

Dhafer Marzougi

- NCHRP 22-29 Longitudinal Barriers on curves and superelevated roadway sections. Analysis is complete and near the end. Used Vehicle Dynamics Analysis to select critical FEA. Use FEA simulations to select critical full scale crash tests. Looked at 32" NJ, 29" G4(1S), 31" MGS. 2270 P and 1100C, curves with radii from 614 feet to 3050 feet and superelevation from 6, 8, and 12 degrees. Shoulder widths from 4 to 12 feet, Shoulder angles from zero to 8 percent down. Also looked at various impact speeds and angles. Looked at barrier placed normal and parallel. One test has been run. It was simulated to be an override but the tire snagged under the rail and the pickup was actually redirected.
- Modeling the 2010 Toyota Venza crossover. Started with a model used for EPA analysis and added more interior components, suspension system, bumper, steering, etc. Now in validation stage.
- Toyota Camry coarse mesh model. Validated with NJ barrier test with a Hyundai sonata.

New Business / Old Business

2016 Fall meeting in Florida but date and location are subject to Derwood Shepherd.

2017 Spring meeting in Lincoln. Fall meeting in College Station.

Executive Committee Summary: Lohrey still needs a co chair for Breakaway Supports. Paterson will check with his co chair. RXR subcommittee will need to determine if they continue or not. Presentations will be posted to website subject to space available and approval of presenters. MASH 09 or MASH 16 on website? In addition to cable barriers, need to consider if reverse direction test vehicle will be changed and does that require additional testing??

Call for abstracts for 2017 international roadside conference.